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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,212	08/01/2003	Michael J. Cudzinovic	10031.000200	3264

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EXAMINER

FICK, ANTHONY D

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 12/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/633,212	CUDZINOVIC ET AL.	
	Examiner	Art Unit	
	Anthony Fick	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/24/03 12/19/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 through 4, 9 through 11, 14 through 16, 18 and 21 through 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Bucker (U.S. 4,387,116).

Bucker discloses a method of forming layers on a solar cell surface.

Regarding claims 1 and 2, figure 1 shows a solar cell with layers on top. Bucker discloses forming an ink pattern, 16, on a first layer, 14, the ink being a silk-screened, asphalt-based, ink mask, and then etching the first layer using the ink pattern as a mask (see figures 1 and 2 and column 2, paragraph 2). It is the position of the examiner that the ink is devoid of silicon dioxide as it is asphalt based and would not scratch the layer beneath the ink.

Regarding claim 3, Bucker discloses the first layer is silicon oxide layer (column 2, paragraph 1).

Regarding claim 4, Bucker discloses screen-printing the ink pattern (column 2, paragraph 2).

Regarding claims 9 and 10, Bucker further discloses forming an oxide layer over the silicon solar cell (column 2, paragraph 1), the oxide layer, layer 14 in figure 1.

Bucker further discloses screen-printing an ink pattern, 16, on the oxide layer, 14, the

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ink being a silk-screened, asphalt-based, ink mask, and then etching the oxide layer using the ink pattern as a mask (see figures 1 and 2 and column 2, paragraph 2). It is the position of the examiner that the ink is devoid of silicon dioxide as it is asphalt based and would not scratch the layer beneath the ink.

Regarding claim 11, Bucker discloses heating the oxide layer, thus the oxide is thermally grown (column 2, paragraph 1).

Regarding claims 14 and 15, figure 1 shows a solar cell with layers on top. Bucker discloses printing an ink pattern, 16, on a first layer, 14, the ink being a silk-screened, asphalt-based, ink mask, and then etching the first layer using the ink pattern as a mask (see figures 1 and 2 and column 2, paragraph 2). It is the position of the examiner that the ink is devoid of silicon dioxide as it is asphalt based and would not scratch the layer beneath the ink.

Regarding claim 16, Bucker discloses the first layer is silicon oxide layer (column 2, paragraph 1).

Regarding claim 18, Bucker discloses screen-printing the ink pattern (column 2, paragraph 2).

Regarding claims 21 and 22, figure 1 shows a solar cell with layers on top. Bucker discloses forming an ink pattern, 16, on a first layer, 14, the ink being a silk-screened, asphalt-based, ink mask, and then performing a processing step, etching the first layer, using the ink pattern as a mask (see figures 1 and 2 and column 2, paragraph 2). It is the position of the examiner that the ink is devoid of silicon dioxide as it is asphalt based and would not scratch the layer beneath the ink.

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Regarding claim 23, Bucker further discloses after etching, depositing a layer of nickel using the ink as a mask (column 2, paragraph 4).

Regarding claim 24, Bucker discloses the first layer is silicon oxide layer (column 2, paragraph 1).

Regarding claim 25, Bucker discloses screen-printing the ink pattern (column 2, paragraph 2).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5, 7, 8, 12, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bucker as applied to claims 1 through 4, 9 through 11, 14 through 16, 18 and 21 through 25 above, and further in view of Matsushita et al. (U.S.P.G.Pub 2002/0000242).

The disclosure of Bucker is as stated above for claims 1 through 4, 9 through 11, 14 through 16, 18 and 21 through 25.

The differences between Bucker and the claims include etching of material after removing the ink pattern and the etching exposing a silicon material.

Matsushita teaches a method to manufacture a thin film solar cell module. The method provides a mask pattern on top of a silicon oxide film, etches the silicon oxide

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film using the mask, removing the mask and then wet etching the silicon layer underneath (paragraph 0129).

Regarding claim 5, it would have been obvious to one having ordinary skill in the art at the time the invention was made to etch down to the silicon material as in Matushiita in the method of Bucker because this allows contacts to be formed with the silicon layer.

Regarding claims 7, 8, 12, 17 and 19, it would have been further obvious to one having ordinary skill in the art at the time the invention was made to etch the silicon oxide layer, then remove the mask and further etch the silicon material as in Matushiita within the method of Bucker because this allows monolithic thin film single crystal silicon solar cells to be separated from each other on a transparent substrate (Matushiita paragraph 0141). Because Matushiita and Bucker are both concerned with fabricating solar cells, one would have a reasonable expectation of success from the combination. Thus the combination meets the claims.

5. Claims 6, 13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bucker as applied to claims 1 through 4, 9 through 11, 14 through 16, 18 and 21 through 25 above, and further in view of Dill et al. (U.S. 4,838,952).

The disclosure of Bucker is as stated above for claims 1 through 4, 9 through 11, 14 through 16, 18 and 21 through 25.

The difference between Bucker and the claims is the requirement that the solar cell is a backside-contact solar cell.

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Dill teaches a backside-contact solar cell as shown in figure 3. Dill further teaches creating the electrical contacts by etching an oxide layer using a mask (column 4, paragraph 2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to etch a backside-contact solar cell as in Dill in the method of Bucker because backside-contact solar cells can have a smooth front surface and therefore a non-scattering solar cell results (Dill abstract). Because Dill and Bucker are both concerned with methods of making solar cells, one would have a reasonable expectation of success from the combination. Thus the combination meets the claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday thru Friday 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Fick *ADF*
AU 1753
December 7, 2006


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